CS3 Rubric

Case Study Rubric

- Due: TBD
- Submission format: upload pdf and link to GitHub repo to Canvas

General Description:

- Submit to Canvas your PDF and a link to your GitHub repository.

Why am I doing this?

- This study is an opportunity to build upon your understanding of machine learning by developing your own deep learning model using PyTorch.
- It mirrors real-world tasks you may face in both academic research and applied AI roles, especially in medical imaging.

What am I going to do?

- Train a machine learning model using PyTorch that can segment kidney images more accurately than a random guess
- The model will split the provided data using a train test split to avoid overfitting
- Your submission will include:
  - Written Portion PDF
  - GitHub Repository with code and output

How will I know I have succeeded?

- You will meet expectations on this case study when you fulfill the criteria outlined in the rubric below.

Formatting

- Written Portion: Submit the written portion as a PDF document.
  -3-5 page document describing the process of training the model, choosing a train test split, and the results of the final model

- Data & Code:
  - Submit all code in a GitHub repository.
  - Include scripts for data loading, training, and evaluation.
  - GitHub should be titled 'CS3-[FirstName-LastName]'
- References:
  - Include on a separate page in IEEE citation style.

Written Portion

- Problem Summary: Describe the task of kidney tumor segmentation and its relevance.
- Project Plan: Outline your modeling approach and include a diagram.
- Train Test Split: Describe what train test split was chosen and why
- Difficulties: Outline any difficulties that arose during the case study
- Results and Interpretation: Discuss performance metrics and their meaning.
- Reflection: Share challenges, resolutions, and future improvements.

Code

- Data Preprocessing: Scripts for loading and preparing dataset.
- Model Training: PyTorch code for training with train-test split.
- Evaluation: Dice score, Jaccard index, precision, and recall.
- Documentation: Well-commented code and a README with instructions.

References

- Include a bibliography in IEEE style.
- Cite external sources used, excluding those already provided.